Chapter Twenty-Five

Mission: Future

Opportunity knocks for future engineers.

—Editorial headline, iNews—

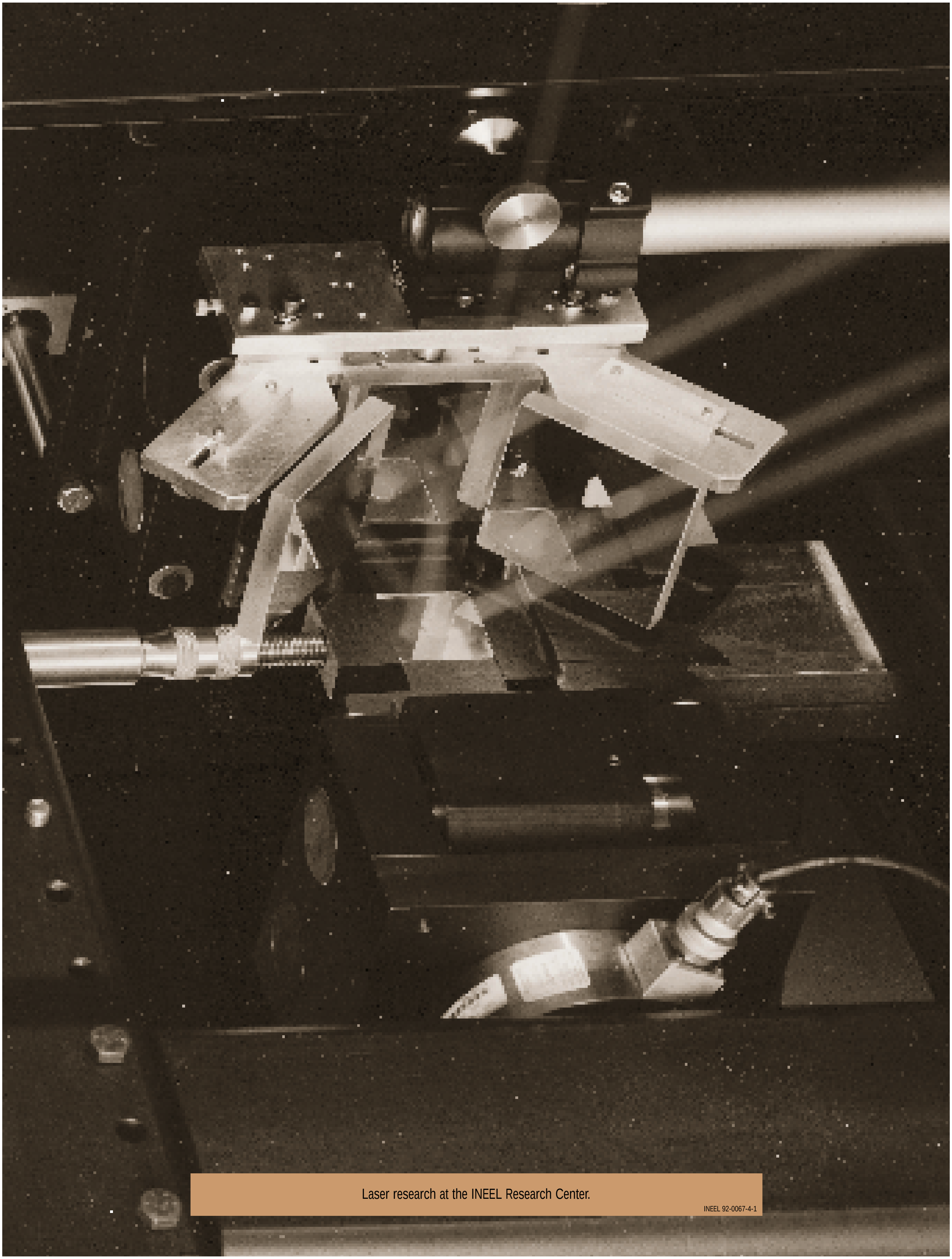
Dirk Kempthorne felt that INEL's future rested on the environment. As a United States senator from Idaho in 1993 he proposed that INEL change its name again by adding to it the word "environmental." He said, "the plain fact is that the INEL is now, will be, and must always be, known as an environmental lab. INEL should be recognized as the leader in solving tough environmental problems." But it took time for the name-change proposal to become official. Until 1997, the name continued as INEL, but then Site letterhead changed to Idaho National Engineering and Environmental Laboratory (INEEL), and the new logo assumed the environmental colors of green and tan.[1]

And indeed, the mission of the INEEL into the 21st century was going to involve—at the very least—a great variety of interaction with the environment. The industrial and nuclear history of the Site had left its mark on the desert, and the time had arrived to remediate or remove what DOE chose to call the environmental "legacy" of the Cold War. Although the struggle between Idaho governors and DOE over the storage of TRU waste and spent nuclear fuel had captured most of the headlines in Idaho after 1988, much else had been afoot at the laboratory in the last two decades of the 20th century.[2]

Not long after President George Bush appointed Admiral James Watkins as secretary of DOE in 1989, Watkins said he felt that "protecting the environment...is not at all inconsistent with advancing both energy security and national security needs." DOE funds committed to environmental cleanup began to rise. By January 1992, some of that funding was reflected in an employment level at the INEL of 12,700 people. In 1992 DOE's environmental restoration and waste management budget request increased by twenty-five percent. By 1995, sixty percent of the INEL budget was directed to waste management, cleaning up, dismantling obsolete buildings, and decontamination.[3]

Watkins appointed Augustine Pitrolo to succeed Don Ofte, who became eligible to retire from federal service and did so in 1989. In June 1989, the Federal Bureau of Investigation had raided the Rocky Flats plant in Colorado, suspecting that its managers had engaged in criminal negligence of national environmental laws. Reacting to this—and to what he regarded as the managerial "mess" of DOE's organizational structure—Watkins felt that DOE's field offices had to surrender a great deal of policy-making autonomy in the interest of more centralized control and implementation from Headquarters. Organizational charts changed, and once more an ex-Navy nuclear engineer attempted to impact the work and the culture of DOE and its labs.[4]

Pitrolo's responsibility was to assure that the INEL was in compliance with environmental regulations and to help Watkins achieve a disciplined response to DOE Headquarters initiatives. He set



Laser research at the INEEL Research Center.

INEEL 92-0067-4-1

in motion the analysis and procedures that would result in the 1994 consolidation of five major Site operating contracts under one contractor, Lockheed Martin Idaho Technologies Company. Henceforth, DOE announced, every incumbent contractor could assume that the next complex-wide contract would be competitive. New evaluation and selection criteria were expected to hold down costs and improve performance on well-defined tasks.[5]

LOCKHEED MARTIN

Environmental compliance tasks were structured by a variety of laws pertaining to the removal of hazardous wastes. The INEL had been designated as a Superfund site under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This and several other laws required that lands and waters contaminated by hazardous substances be inventoried, evaluated, and remediated. The Environmental Protection Agency, DOE, and the Idaho Department of Health and Welfare mutually agreed in 1991 to work as partners in executing a consent order spelling out how each problem area at INEL would be prioritized and remediated.[6]

Learning to Love D&D

Fred Tingey said to me, "I have a favor to ask of you. We're in the process of starting up a D and D program at the Site. It'll be the first new program that EG&G has started and not inherited from the previous contractor. We'd like it to look good, get it organized well and done right. I'd like you to set it up."

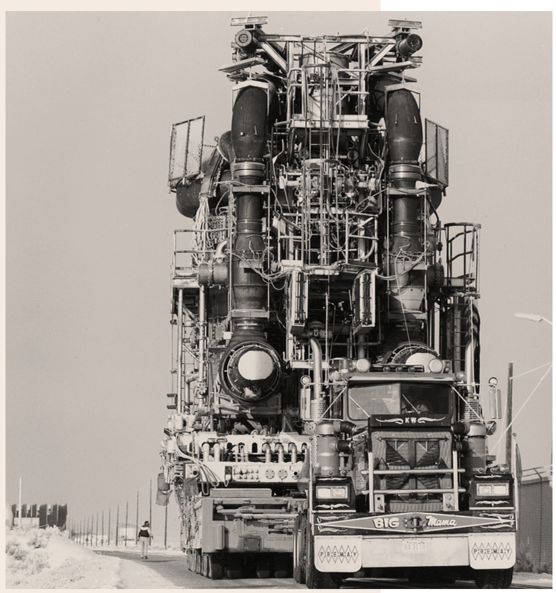
As he told me all this, my mind was racing a hundred miles an hour. I'd never heard of D and D and I didn't know what it meant. Finally I said, "Fred, I'm really embarrassed. You keep talking about D and D, and I'm not sure what that means."

He said, "Oh! Well, it's decontamination and decommissioning. It's in the waste management program." I just about died. In those days, waste management meant garbage. I had seen pictures of trucks hauling stuff and dumping it in a pit. How do you explain to your family—your parents especially—that they've invested all this money to get you trained as a scientist, and now I was going to leave the high-tech world of lasers and start dumping stuff in pits! I felt horrible.

By the time I got the program set up and operating, it was one of the more interesting things I'd ever done. There was lots of boom-boom stuff, and we had research money. It was fun figuring out how to decontaminate something. We looked at biodecontamination of soil and all kinds of explosive dismantlement techniques for structures.

When you got done with a job, it was very satisfying to walk away and see green grass growing there: a site returned to its natural conditions. Or we made a building useful for someone who needed a facility, and we provided it at a fraction of what it would cost to build new. I stayed fifteen years.

Richard Meservey



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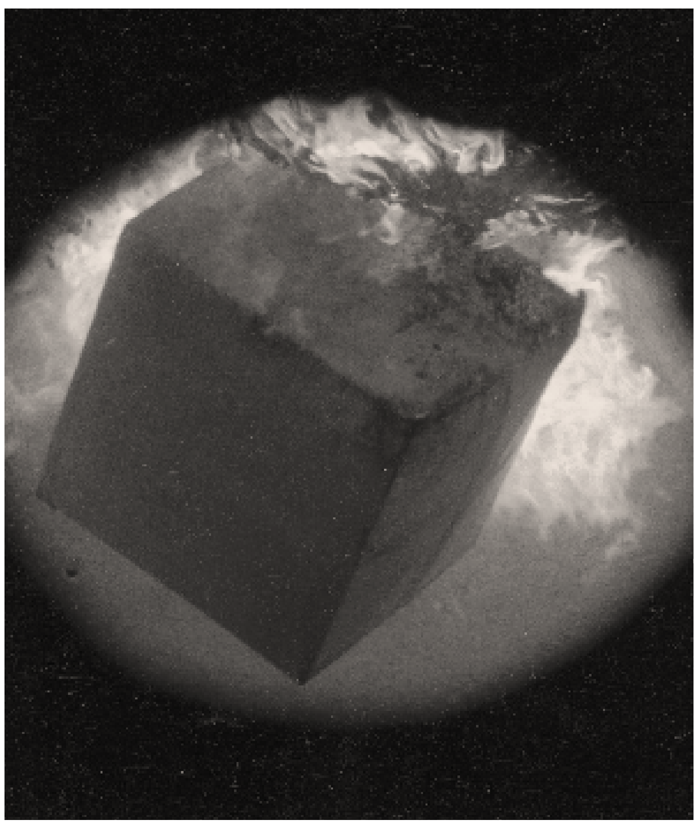
Not everything from historic programs was dismantled. In 1988, Big Mama hauled the two HTR experiments from the Aircraft Nuclear Propulsion program at Test Area North to a visitor center at the site of EBR-I.

The laws laid a grid of regulatory compliance vocabulary over the entire Site. The familiar old names—Central Facilities Area, Test Reactor Area, Test Area North—took on additional labels as "Waste Area Groups (WAGs)." There are 10 WAGs at the INEL. Individual remediation targets within the WAGs became "Operable Units (OUs)." The CERCLA work was, however, heavily laced with checkpoints and consultations among the three agencies. The burden of interagency communication and public hearings sometimes seemed to the workers to exceed the actual work of removing and treating the hazardous materials. WAG 10 included the desert land beyond the fences of the Site's nine main activity complexes. In WAG 10, DOE combed the desert for—and found—unexploded ordnance and chunks of TNT from Naval Proving Ground detonation tests and bombing practice.

When seen through a CERCLA lens, the Site seemed to be a collection of wastewater ponds, sewage lagoons, burn pits, tank sites, spill sites, waste injection wells, leach fields, landfills, evaporation ponds, contaminated buildings, and once-leaky pipes. Traces of the industrial and radioactive materials that had been the ingredients of daily work for so many years had settled in patches of soil, on concrete walls, in lab drains and vents and sumps.

But a CERCLA lens was a feeble tool. When seen through the lens of science, the Site was something else entirely: the impact of human activity on the desert environment opened up a brand new laboratory. The theme of "waste management" became a new platform from which to leap into new frontiers of knowledge. Waste was an environmental problem all over the world, and the INEEL would, as Kempthorne had said, "lead." Scores of biologists, chemists, metallurgists, engineers, and the other specialists focused on the home ground.



INEEL 84-621-1-10

Box of waste is burned at the Waste Experimental Reduction Facility.

Ironically, the laboratory building to which many of these scientists reported for work was located in Idaho Falls, not out on the desert. The INEL Research Center (IRC) had been a growing part of the research and engineering mission since 1983. Idaho senator James McClure, who had been responsible for securing the funds for the lab from Congress, dedicated it in April 1984. Like so many other leaps into the future taken by Site employees, the IRC materialized because of a strategic assessment of the future that hit the bull's eye. Dennis Keiser was director of research and development and vice president of EG&G, the IDO's prime contractor in the early 1980s. Keiser said:

The major drive for the laboratory was the need to support the nuclear reactor safety program. We needed to develop diagnostic and instrumentation devices for LOFT, PBF, and other safety test reactors. At first, we planned to build the lab out on the desert, but energy conservation was a major issue at the time, and transportation was cheaper in town.[7]

The First IRC Building

The first structure on the IRC property was the fuel alcohol plant. During the Carter administration, DOE was promoting alternative energy sources such as making fuel alcohol from grain. This idea quickly caught the attention of farmers who hoped that making their own fuel might reduce their operating costs.

But a lot of scam artists picked up on the idea as well, and they started selling alcohol plants to farmers at a price around $50,000. These, of course, didn't work. Farmers began complaining to DOE or asking for help.

So DOE decided to build a reference standard plant here in Idaho Falls. The idea was for us to identify the kinds of operating criteria that the buyer of a plant should look for in making a purchase. For example, one of the criteria had to do with how many gallons of alcohol per hour the plant should produce, and another related to the number of hours per day that the plant could reasonably operate.

After we built and operated the plant according to the reference criteria, we found that a plant that would actually work had to cost around $1 million. And the operator had to be pretty sophisticated. The operation was, in fact, a chemical processing plant, and you couldn't allow contamination to affect the fermentation and distillation processes. If you did, productivity went way down, and the economics of it became marginal at best.

In the end, not a lot of fuel alcohol plants were built, partly because we managed to educate a lot of farmers about what it would really take to run one profitably. Senator Frank Church had been a big supporter of the fuel alcohol program. After he was defeated [1980], James McClure became Idaho's senior senator. He favored other research directions, and the alcohol plant went the way of the Raft River geothermal project. Eventually, the plant was dismantled and shipped to the Tennessee Valley Authority.

Because of the fuel alcohol plant, though, the INEL hired its first biochemist and microbiologist. We acquired a capability in these fields that we hadn't had before, and these continued to grow and evolve.

Tony Allen

The fuel alcohol plant at the INEL Research Center.

INEEL 81-3504

He found a thirty-five-acre farm at the north edge of Idaho Falls owned by an older couple whose children wished to relieve their parents of the rigors of farm management. EG&G bought the property and became the proud owner of a barn, farmhouse, and potato cellar. The first structure to go up on the property was a fuel alcohol plant, which sat on a concrete pad. A trailer containing the plant controls was parked nearby. Soon came another building. Keiser continued:

As we designed the laboratory, we thought twenty to twenty-five years into the future. We made an aggressive push for new research programs and we were very successful. The first major program, which was for the Bureau of Mines, proved to be the seed that took off in many other directions still working today. The Bureau was interested in the biological processing of ores, and the nation's earliest work in this field began here. Microbes live off of the sulphur in some ores and produce sulfuric acid, which dissolves the metal and makes it possible to selectively remove the metal. The technique is particularly effective with copper ores.

The Bureau also was looking for a substitute for chromium in metal alloys. The United States depended on other countries for chromium, but this was a strategic metal, and the Bureau did not wish to rely on South Africa or Russia for supplies. IRC scientists succeeded in developing new alloys, and this work led to the development of super-plastic alloy systems and better magnets now used in computers.

In connection with alloys, the Bureau also had a welding program. One of the criteria for any new alloy was whether or not it was weldable. So the IRC did welding research. Eventually, this work evolved toward the development of automatic—robotic—welding, in which a system monitors the welding process using complex interactions of computers, mathematics, and electronics. Without the decades of accumulated experience in hot cell work, this innovation might not have come about. Those successes attracted the attention of the Department of Defense, which came to the IRC with a number of classified projects. IRC work included membrane research, where the challenge was to separate hazardous ions from liquid solutions. This, too, continued as a major research activity.

It turned out that our vision was a good one. We deliberately went in new directions that were uncharted by other DOE labs. We identified new areas where we thought American research and development would enter. We had little competition, and we continued to build on new knowledge and apply it in many different directions.

We did have to rename the lab, though. One day Troy Wade, the IDO manager, and I were showing Governor Andrus through the lab. At the time, the lab was named the Idaho Laboratory Facility. Andrus asked us if the lab was owned by DOE or whether it was a private facility. We realized immediately that we had to put "INEL" in the name. [8]

With laboratories for geophysics, chemistry, microbiology, and other sciences, the IRC was well-equipped to add the environmental cleanup mission to its many others. Cleanup technologies had to be safe for workers and be economical, which usually meant reducing the volume of the waste. Technologies tested and proven at the INEL were expected to benefit the rest of the globe, not just Idaho and the INEL.

For example, IRC scientists built on their mining microbiology experience and pioneered biodecontamination. While studying how microbes in the desert soil affect the stability of buried concrete, scientists discovered a microbe that might strip radioactive contamination from concrete floors, walls, and ceilings. After conducting experiments in the basement of EBR-I, IRC scientists perfected a means of applying the microbe so it would stick to a wall. They came up with a gel made of cellulose, elemental sulfur, and the microbes. The microbe metabolizes

INEEL 89-290-1-9


INEEL 97-438-1-5


INEEL 83-275-1-11


INEEL 96-667-3-5


INEEL 91-181-2-10

INEEL facilities in Idaho Falls in 1999 included, from top, DOE-ID South, Engineering Research Office Building (EROB), Willow Creek Building (WCB), the INEEL Research Center (IRC) and Technical Support Buildings A and B (TSA and TSB).

INEEL 99-233-1-25

Above. Concrete-eating microbe gel has removed as much as twelve millimeters of concrete per year in laboratory conditions. Below. Operator uses rapid geophysical surveyor at Bighorn Battlefield in Montana.

INEEL 95-234-1-15

the sulfur, creating sulfuric acid. The acid etches the concrete surface and loosens the top millimeters of the concrete. After a few months, a human comes along, vacuums the degraded concrete, and disposes of it. The method was safer than dressing up a team of people in anti-contamination gear to chip concrete. Besides, some radiation fields are too high to allow this, or contamination resides in areas hard to reach. The method was better than demolishing a whole building and treating the entire volume of rubble as a radioactive waste. As of 1999, the "eat and be merry" microbes were on their way to the United Kingdom to prove that they could clean up the concrete walls of the Windscale Pile 1 reactor in Sellafield.[9]

Other IRC researchers built upon the capabilities acquired during the Raft River geothermal project. They invented a "rapid geophysical surveyor," capable of "seeing" several feet beneath the surface of the old Burial Ground and differentiating the closely-spaced pits and trenches from one another. This tool was also taken to the Bighorn Battlefield in Montana to help find remains of twenty-eight soldiers who had perished, historians believed, somewhere in Deep Ravine. A private company in Idaho Falls went into business to market the surveyor. The gadget then served at a long list of Superfund sites and other DOE facilities requiring detailed characterization prior to cleanup.[10]

In short, the IRC labs tackled every aspect of waste management. Scientists monitored and characterized waste, counted it, moved it, prevented it, reduced it, analyzed it, modeled it. They treated, burned, biomassed, shredded, buried, and exhumed waste. Some of it they exploded, pumped, shrunk, calcined, or vitrified. Each activity was an opportunity for research, experiment, and a comparison of alternatives. And always, the cleanup of the Site was a route to new ideas, new customers, and new contracts. Every innovation was potentially a bridge to new opportunity.

In 1995, after DOE Headquarters convened a task force to consider the future of the national laboratory system, the group, chaired by Robert Galvin, recommended among other things that DOE more carefully coordinate and focus the work of all of its labs. It suggested that DOE identify "lead laboratories" whose responsibility it would be to take a broad national view of a specific problem, assess or characterize it, and coordinate an overall strategy that would exploit the strengths of all DOE resources in solving it most efficiently. DOE followed this recommendation. Designation as a "lead lab," naturally, brought with it a certain prestige. The system attempted to end duplicative and inappropriate competition among the national labs. While the system implied some reduction in autonomy for each lab in defining its mission, it also granted new opportunities for a single lab to have an impact on a national problem or mission.[11]

Thus, it was a moment of pride at the INEL when DOE named it as its Lead Laboratory for Environmental Management in 1994. Lead labs also were expected to be "test beds" for the improved methods and techniques that would tackle an environmental clean-up problem. The many enterprises of the resourceful teams of people at the IRC at its desert "test bed" had helped to shape the future of the INEL.[12]

The nuclear legacy of the Site offered paths to new missions *via* "technology transfer," a DOE program Pitrolo inaugurated in the early 1990s. The philosophy behind this program was to exploit the expertise acquired at nuclear laboratories as a benefit to society through private industry. Thus the "core competencies" acquired over the years were another bridge to new missions. For example, by building reactors with control rods able to scram a reactor in a microsecond, the engineers at the Site knew how to make a heavy object move very fast. The challenge of technology transfer in this case, is to adapt this know-how to other industries that needed to move heavy objects very fast.[13]

Evidence that the INEEL had capabilities valued by private industry accumulated in the form of a growing list of Cooperative Research and Development Agreements (CRADAs). These were partnerships in which private companies invested in an IRC research program aimed at perfecting a product for commercial application. By 1999 INEEL had 105 CRADAs to its credit. IRC scientists regularly won "R&D-100" awards presented by *R&D Magazine*, which recognized each year only a hundred research and development innovations in the country.

Nuclear research at the INEEL continued to be a presence amidst the ever-evolving continuum of ideas moving from some stage of theory to engineered hardware. Several dozen nuclear scientists worked in various laboratories around the Site. Considering the possibility that global warming (caused by the emissions of fossil fuel power plants) or other events might reawaken the nation's interest in nuclear power, some of these scientists continued to advance the case for socially responsible nuclear power plants. The IFR may have been ahead of the political and social market, but the notions that a reactor should—and could—be inherently safe, resist plutonium diversion,

INEEL 99-0293-1-24

Above. To learn how water flows through zones of fractured rock, INEEL did a field study of a fracture at Hell's Half Acre, a lava field west of Idaho Falls. Sensors record water dripping from an artificial pond through a fracture in an overhang. Right. INEEL cleaned up waste left by activities at the Naval Proving Ground. Soil contaminated with TNT was collected, mixed with acetone to dissolve the TNT, and the mixture composted. The process avoided accidental detonation and fugitive dust problems. Here, material goes into composter.


INEEL 87-0623-1-11

Don Ofte


INEEL 90-1-53-4

Augustine Pitrolo


INEEL 91-328-4

John Wilcynski

and minimize waste now were driving reactor research. Scientists considered concepts for gas-cooled or liquid-lead-cooled reactors and studied new ideas on corrosion-resistant materials and cladding that might allow higher temperatures and more-economical operation. Other analysts continued the tradition of reactor safety work for the Nuclear Regulatory Commission: updating safety codes for commercial reactors, improving the human interface with reactor control systems, analyzing steady-state and transient thermo-hydraulic phenomena in reactors.[14]

In 1997 DOE Headquarters established a Nuclear Energy Research Initiative (NERI), a program that invited scientists and engineers from all over the DOE complex to collaborate with each other, private companies, and universities. They were to propose their best ideas for nuclear research and request funds to carry it out. Three hundred bids entered the first round, forty were funded, and five of these went to the INEEL. The scale of the program was modest compared to the earlier thrusts to create a nuclear navy and a nuclear power industry, but it invited new concepts and proof-of-principle opportunities.

At Argonne-West, scientists likewise continued to promote the philosophy behind the IFR, if not the IFR itself. In the aftermath of the EBR-II shutdown, something had to be done with the IFR fuel that had been tested. It had been designed for burnup and recycling, not storage or chemical reprocessing. Argonne took five percent of the IFR fuel, developed a way of stabilizing it using an electro-metallurgical treatment, and proposed to apply the treatment to the rest of the fuel. Beyond their own "waste" fuel, Argonne scientists felt that an industry-wide concentration on the "tail end" of the fuel cycle was long past due, and they intended to promote it as important work that needed to be done well.[15]

At the Chem Plant, which changed its name in 1999 to Idaho Nuclear Technology and Engineering Center (INTEC), the mission continued to focus on the technologies of receiving and storing spent fuel or calcining the waste still remaining at the plant. The reprocessing facilities, in which so much had been invested, remained on standby in case a new mission for them should emerge. Because the Chem Plant engineers, scientists, and managers had acquitted themselves so well in their handling of high-level radioactive wastes, hazards and problems in Idaho were much less urgent than they were at other DOE reprocessing facilities. Money to deal with urgent problems went elsewhere in the DOE system, a fact that sometimes seemed to old Chem Plant employees an ironic reward for good behavior.[16]

With INEEL work roughly divided into sixty percent for waste cleanup and forty percent for other research missions, John Wilcynski, IDO manager from 1994-1999, summarized the path forward with the words, “Finish the sixty and grow the forty.” The cleanup would eventually get done and the mission disappear. Dismantled buildings particularly symbolized this trend. By September 1999, the INEEL had cleaned up scores of sites and demolished 215 buildings or structures, and the next to go was the Experimental Organic Cooled Reactor, which had run out of scrounge value. After the Special Response Team appropriated the building in 1984 as a training center, security forces practiced hostage rescues and anti-terrorism tactics. Now the old building was surplus even for that mission.[17]

The research and development business would, on the other hand, have to grow. Whether it would grow absolutely or only as the larger portion of a shrinking whole was the question. Although INEEL would always rely on its work force to grasp opportunities to be brilliant, Wilcynski continued to refine the terms by which the INEEL related to the many potential allies among its Idaho neighbors.

The INEEL had, for example, recognized the Shoshone-Bannock tribe as a sovereign tribal nation. By virtue of a pact made with the tribe in 1992, INEEL provided training and equipment so the tribe would have an independent environmental monitoring capability. It also agreed to protect Native American artifacts on Site grounds. Wilcynski continued to consult with the tribe on matters of mutual importance.[18]

INEEL
Idaho National Engineering & Environmental Laboratory
BECHTEL BWXT IDAHO, LLC

Don Ofte had worked with the University of Idaho and the Idaho State University to improve higher education opportunities in nuclear engineering at those schools. The U of I opened a doctoral program in nuclear engineering, the first established in the United States since 1965. Ofte made the laboratories of the IRC available to graduate students. ISU initiated an independent environmental monitoring program, a way of validating Site data. Wilcynski advanced INEEL ties to higher education as he prepared the bid specifications for a new Site operating contract in 1999. The winner was a consortium of interests led by Bechtel BWXT of Idaho that included the Inland Northwest Research Alliance, a group of seven universities including the U of I and ISU.[19]

DOE established a policy of supporting a Citizens Advisory Committee at each of its field facilities. This group of citizen volunteers from across the state and a variety of professions reviewed waste management and other issues as a constructive path to greater public knowledge and information about INEEL operations. Wilcynski welcomed this

First convened in 1994 the INEEL Citizens Advisory Board is an independent panel of fifteen Idaho citizens. The board provides consensus advice to IDO and its regulators, and contributes in-depth public involvement for many IDO decisions.

group when it convened for the first time in 1994 and continued to receive its advice.[20]

The IDO continued to enjoy the support of its irrepressible eastern Idaho supporters, which never had abandoned the Site. Nuclear protesters had scorned the Idaho Falls Chamber of Commerce as a jobs-are-our-only-concern outfit, but the Chamber had in fact not ignored the findings of science in its reaction to events affecting the Site. In looking for a stable regional economy, traditional Site supporters were aided by new institutions, notably the Eastern Idaho Regional Development Alliance. Organized to distribute DOE Settlement Agreement grants intended to promote regional economic diversification, the Alliance hoped to retool part of the Site as a spaceport for launching rockets and space-travel vehicles.[21]

Another new organization, Coalition 21, worked to revitalize the nuclear research mission of the Site. The non-profit group attracted Site retirees, ISU faculty members, business owners, and others who believed that nuclear technology had much to offer the nation and the world in the 21st century. The group had supported the Settlement Agreement and helped defend Governor Batt against Proposition Three in 1996. Coalition 21, whose motto was “supporting tomorrow’s technologies with facts, not with fears,” advocated continued research on the IFR and other technologies promoting safe nuclear reactors and innovative solutions to the management of spent fuel.[22]

The Snake River Alliance, continued as an INEEL “watchdog group.” News reporters faithfully consulted its representatives in order to balance waste-related news stories. In 1999 the Alliance (among others) opposed INEEL’s proposed Advanced Mixed Waste Treatment Project, a facility intended to treat certain Rocky Flats waste to prepare it for shipment to WIPP. A feature of the Settlement Agreement, the facility had the support of the governor’s office, which was then staffed with a nineteen-member INEEL Oversight Office monitoring waste management.[23]

In 1999 a member of the generation that had arrived at the Site in the environmentally exuberant 1970s became the new and first woman IDO manager. Beverly A. Cook, metallurgical engineer, joined the INEL in 1975 with Aerojet Nuclear. She spent her first days on the job behind the glass shielding window of a hot cell, where she had some lessons to learn.

The technicians were prone to making each new engineer open a tool box and remove its contents using the remote manipulators—a procedure that took me, an amateur, all day. They taught me the concept of a “non-recoverable situation” in a hot cell, that is, a situation that cannot be fixed, like dropping a piece of radioactive material on the floor where it cannot be reached remotely. It was a valuable lesson: Analyze all of the job to completion before beginning, and do it right the first time.[24]

Secretary of Energy Bill Richardson addresses the crowd attending the INEEL 50th anniversary celebration.

INEEL 99-0409-3-13

INEEL 99-0365-1-15A

Beverly A. Cook

After fifteen years at the Site, Cook's career took her away from Idaho to the Defense Nuclear Facilities Safety Board and then to DOE's Office of Nuclear Energy in Washington, D.C. When she returned, appointed by Secretary of Energy Bill Richardson in 1999, she continued to believe that science and solid engineering techniques can and should be behind decisions that "do it right the first time." Aware that the nuclear skills like those possessed by her hot cell mentors were the kernel of the Site's present and future missions, she observed in an interview that "everything we do here at the INEEL can be tied to the historic expertise we developed." But her charter from Richardson also expressed the ideals of the Galvin task force: the talents at INEEL were to be applied not only at the home lab but at other places around the DOE complex. Corporate resources had to solve corporate challenges. With fifteen years of Site experience, she was well aware of its reservoir of talent.[25]

At INEEL's fiftieth anniversary ceremonies in the summer of 1999, Secretary Richardson named the INEEL, along with Argonne National Laboratory, as a DOE Nuclear Reactor Technology Lead Laboratory. DOE could see that the totality of nuclear expertise in the nation had been shrinking. Nuclear experts were retiring and not being replaced. Yet nuclear energy provided twenty percent of the nation's electricity and larger percentages in other countries. Nuclear safety and nuclear power were not local issues, as the Chernobyl accident made clear. The nuclear safety record in the United States—and the confidence to keep reactors running after the TMI accident—had depended in large part on the experiments and computer work of hundreds of Site scientists. Now DOE Headquarters needed an in-house consultant, as it were, to identify existing expertise, articulate nuclear research needs, and otherwise help the nation regroup and formulate energy technology strategies for the future.

INEEL—or rather, the people of the INEEL—had been moving the frontiers of knowledge and engineering forward for fifty years. The human potential to create ingenious experiments and pick at the edge of knowledge was still a force. The discipline of science—to make a prediction, design a test, carry it out, observe carefully, refine the next prediction—offered the same promise of discovery to a new generation as it had in the halcyon days of nuclear reactor research.

It is altogether possible, even probable, that in 2049, a new generation of retirees will recall their careers around the turn of the century and tell their grandchildren, "It was exciting then. It was all new."